

# **FIRE EXIT DRILLS and ALARM SYSTEMS**

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**NATIONAL FIRE PROTECTION ASSOCIATION**  
International

**60 Batterymarch St., Boston 10, Mass.**

# National Fire Protection Association

## INTERNATIONAL

*The National Fire Protection Association, a non-profit technical and educational organization, was organized in 1896 to promote the science and improve the methods of fire protection and prevention, to obtain and circulate information on these subjects and to secure the cooperation of the public in establishing proper safeguards against loss of life and property by fire. Its membership includes over a hundred and seventy-five national and regional societies and associations, and over thirteen thousand individuals, corporations and organizations.*

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# Fire Exit Drills and Alarm Systems

This pamphlet consists of sections reprinted from the Building Exits Code, eleventh edition, 1951, which was prepared by the Committee on Safety to Life of the National Fire Protection Association, subsequently adopted as the official standard of the Association.

These sections are reprinted for convenience of those particularly interested in fire exit drills and fire alarm systems and make reference in several instances to other portions of the Building Exits Code. The complete code is available from the National Fire Protection Association at \$1.00 per copy.

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## Section 10.

### Building Exits Code.

#### ALARM SYSTEMS.

1000. Manually operated fire alarm equipment in accordance with the following specifications, shall be provided in all buildings where required by the several occupancy sections.

If a building is divided by one or more fire walls, each section shall be considered a separate building in applying the foregoing requirements.

1001. This code does not provide details of construction and arrangement of alarm systems, nor do its requirements extend beyond those necessary for safeguarding occupants from fire and fire-panic hazards.

NOTE: The installation of alarm systems in accordance with this code will serve to decrease the fire hazard to property. It is strongly recommended that alarm systems be installed so that in addition to complying with the requirements of this code, they will also comply with the Standards of the National Fire Protection Association for the "Installation, Maintenance and Use of Central Station Protective Signaling Systems for Watchman, Fire Alarm and Supervisory Service," and for the "Installation, Maintenance and Use of Proprietary, Auxiliary and Local Systems for Watchman, Fire Alarm and Supervisory Service" thus affording greater protection to property.

Electrical notification systems are preferable to mechanical notification systems where conditions are such as to require more than one sounding station and, usually, where more than one sounding device is required. Mechanical systems are used where but one station is required, particularly where it would be difficult to secure regular and responsible maintenance of an electrical system.

1002. Systems shall be under the supervision of a responsible person who shall cause proper tests to be made at frequent intervals and have general charge of all alterations and additions.

NOTE: No type of signaling equipment is sufficiently automatic or durable to avoid the necessity for periodical inspections and working tests of all its parts. Especial importance is placed upon the efficiency and reliability and the methods employed in maintaining and in inspecting alarm systems.

1003. Systems shall be tested at not less than weekly intervals, subject to the provisions of the occupancy sections applying. (§§2144, 2316, 2461, 2576, 2616, 2722, 2816.)

1004. Fire alarm signaling equipment shall be restored to service as promptly as possible after each test or alarm, and shall be kept in normal condition for operation. Equipment requiring re-winding or replenishing shall be rewound or replenished as promptly as possible after each test or alarm.

#### SOUNDING DEVICES:

1005. Required sounding devices shall be used for fire alarm purposes only.

1006. Alarm sounding devices shall be provided of such character and so distributed as to be effectively heard in every room above all other sounds, where specified by occupancy sections. Visible alarm devices may be used in lieu of audible devices only where specifically permitted by occupancy sections. (See §§1153, 2461, 2576.)

NOTE: Visible alarm devices in addition to audible alarms are desirable in buildings occupied by deaf persons.

1007. Alarm sounding devices shall be distinctive in pitch and quality from all other sounding devices.

1008. All manually operated sending stations and alarm sounding devices in a single system should be of the same type.

NOTE: The manner of sounding alarms should be standardized with a view of obtaining uniformity throughout as large a geographical area as practicable, so that persons moving from one locality to another will not be misled and confused by differences in manner of sounding alarms.

This point is of special importance in certain occupancies. For example, pending the time when state-wide uniformity in school alarm systems can be attained, uniformity of alarm signals should be strictly enforced in all public and private schools throughout each city and the adjacent suburban territory.

#### ALARM SENDING STATIONS:

1010. Manually operated sending stations shall be provided near all main exits and in the natural path of escape from fire, at readily accessible and visible points which are not likely to be obstructed.

1011. Sending stations shall be so located that from any part of the building not more than 200 feet will have to be traversed in order to reach a sending station on the same floor, or 100 feet and one flight of stairs to reach a sending station upon another floor located in the natural path of escape from fire. Such stations shall have illumination as required for principal point of exit ways, §1202.

NOTE: It is recommended that at least one sending station be provided upon each floor. Where conditions are such as to require but one sounding device for an entire building, the functions of a sounding device and a sending station may be combined in a single mechanism.

1012. The arrangement of sending stations, and the manner of their connection with sounding devices shall be such that there will be no difference between the sounding of actual alarms and drill signals. (See also §1017.)

NOTE: The manner of operation of manually operated sending stations should be standardized so that persons moving from one locality to another will not be confused by differences.

#### SUPERVISORY CONTROL OF ALARMS:

1013. Systems shall be so arranged that no manual intervention will be required, following the actuation of a sending station, for causing effective response of all required sounding devices. No facilities shall be provided whereby such response can be controlled or modified except where otherwise specifically permitted by an occupancy section.

**AUTOMATIC FIRE DETECTION SYSTEMS—AUTOMATIC SPRINKLER SYSTEMS:**

1014. Connections may be provided between required manually operated alarm systems and automatic fire detection systems or automatic sprinkler systems, provided that the effectiveness and dependability of operation of the alarms from manual sending stations is not thereby impaired, and that §1010 is fully complied with.

**INCIDENTAL FUNCTIONS:**

1016: Manually or automatically operated fire alarm systems may be arranged for the accomplishment of incidental functions such as the release of self-opening or self-closing doors, cutting off supplies of gas, fuel-oil or electric power, switching on emergency lights, the stopping of air supply ventilating fans, and the like, in so far as the accomplishment of such incidental functions does not in any way impair the effectiveness or reliability of the required sounding devices in response to the required sending stations.

**CODE SIGNALS:**

1017. Code signals indicating where the alarm originates should be used only where permitted by occupancy sections. (See §§2219, 2316, 2461, 2576.)

NOTE: It is often advisable to give code signals to those in authority and those who will assist the occupants in leaving the building—as, for example, to principals, superintendents, managers, engineers, members of private fire brigades, etc., who require drills in the interpretation and response to code signals. (See §1153.)

**CONNECTIONS TO MUNICIPAL DEPARTMENTS:**

1018. Fire alarm equipment installed as required by occupancy sections for the notification of the occupants of buildings in localities under protection of regularly organized fire departments or private fire brigades should be arranged to cause automatic transmission of alarms (directly or through an approved central office) to such fire departments or brigades upon operation of any alarm sending station. When no such connection is provided, it is recommended that a fire alarm box arranged to signal the fire department be installed either at the main entrance to the building; at the telephone switchboard or outside the building plainly visible by day or night and conveniently accessible from the main entrance.

1019. Automatic fire department connections (§1018) shall be so arranged as to permit drills to be conducted by those in authority without calling out the fire department, and so that the actuation of any required alarm sending station will surely call such department.

## Section 11

### FIRE EXIT DRILLS

#### Introduction.

1101. The purpose of fire exit drills is to ensure the efficient and safe use of the exit facilities available. Proper drills ensure orderly exit under control and prevent the panic which has been responsible for the greater part of the loss of life in the major fire disasters of history. Order and control are the primary purposes of the drill. Speed in emptying buildings, while desirable, is not in itself an object, and should be made secondary to the maintenance of proper order and discipline.

**NOTE:** The term "fire exit drill" is used to avoid confusion between drills held for the purpose of rapid evacuation of buildings as described in this section, and drills of fire fighting practice which from a technical viewpoint are correctly designated as "fire drills" although this term is by common usage applied to egress drills in schools, etc.

1102. Drills should be held frequently to be effective.

1103. Fire is always unexpected. Drills should be so arranged that they will ensure orderly exit under the unusual conditions obtaining in case of fire. For this reason drills should be habitually held in unexpected ways and at unexpected times. If the drill is always held in the same way at the same time it loses much of its value, and when for some reason in actual fire it is not possible to follow the usual routine of the fire exit drill to which occupants have become accustomed confusion and panic may ensue. Drills should be carefully planned to simulate actual fire conditions. Not only should they be held at varying times, but should use different means of exit, assumption being made, for example, that some given stairway is unavailable by reason of fire or smoke, all the occupants being led out by some other route. Fire exit drills should be designed to familiarize the occupants with all available means of exits, particularly fire escape stairs, and other emergency exits that are not habitually used during the normal occupancy of the building.

1104. In order to secure proper order and control it is essential that the plan and conduct of the drill be in the hands of responsible persons competent to exercise leadership, who have been carefully schooled in what to do in case of fire emergency.

1105. Satisfactory fire exit drills depend upon some suitable fire alarm system, which should be in accordance with Section 10. The fire alarm should be regularly used as the signal to start the fire exit drill.

1106. Fire fighting should always be made secondary to life safety. Where there is a regularly organized private fire brigade instructions should be given to defer any fire fighting operations that might interfere with prompt and orderly exit until after buildings are vacated. Especial emphasis should be laid on not obstructing lines of exit by means of fire hose laid across stairways, and not blocking open protecting fire doors by hose lines, until all occupants are out of danger.

1107. The usefulness of a fire exit drill and the extent to which it can be carried depends upon the character of the occupancy, it being most effective in occupancies where the population of the building is under discipline and subject to habitual control. For example, schools offer

possibilities of more highly developed and valuable fire exit drills than other types of occupancy.

1108. In buildings where the population is of a changing character and not under discipline, for example, in hotels or in department stores, no regularly organized fire exit drill, such as that which may be conducted in schools, is possible. In such cases the fire exit drills must be limited to the regular employees who, however, can be thoroughly schooled in the proper procedure and can be trained to properly direct other occupants of the building in case of fire. In occupancies such as hospitals, regular employees can be rehearsed in the proper procedure in case of fire; such training always is advisable in all occupancies whether or not regular fire exit drills can be held.

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1109. The following suggested Exit Drill plan (§1110) describes an organization and procedure suitable for a large industrial establishment. This plan may be modified to suit other occupancies and smaller buildings.

A suggested plan for fire exit drills in hospitals, sanitariums, and corrective institutions will be found beginning at §1150, and for fire exit drills in schools, §1170. Drills in other occupancies not specifically covered may be organized in accordance with the general principles herein given.

A plan for the emergency organization of hotel employees appears in §§2651-2653.

### **Suggested EXIT DRILL CODE FOR INDUSTRIAL ESTABLISHMENTS.**

1110. Exit drills are intended for the protection and safety of the occupants of buildings, and in order to make them effective every person taking part must realize his or her own responsibility and assist in conducting them in an orderly manner.

Exit drills shall be conducted once in every calendar month and all occupants shall participate therein, unless otherwise specified in the occupancy sections of this code.

#### **Organization.**

1111. Every establishment shall appoint, train and maintain the following organization for the purpose of conducting exit drills:

Chief of Exit Drill	Searchers
Floor Chiefs	Monitors
Room Captains	Inspector
Exit Guards	

Where two or more establishments jointly occupy a building wherein exit drills are required, the several establishments shall confer together and select two employees who shall be designated as chief of exit drill and assistant chief of exit drill respectively. They shall have the same duties as provided for those officers in establishments which are sole occupants of a building. Each particular establishment within such a building shall appoint their own floor chiefs and room captains, etc., whose duties shall be the same as provided for those positions in establishments which are sole occupants of a building.

## Duties.

1112. CHIEF OF EXIT DRILL. He will have general charge of all matters pertaining to exit drills and organization; fix the time for holding drills; enforce disciplinary measures for failure on the part of occupants to observe rules or requirements; see that overcrowding in rooms or elsewhere is prevented and that sufficient space is given to aisles and passageways to permit quick access to all of the exits. He shall supervise the building alarm system. (§1002)

(a) He shall prepare and have conspicuously posted on each floor of each building a notice of the schedule of evacuation and the duties of occupants in case of an alarm.

(b) He shall make a survey of the building to determine the capacity of all exit facilities in accordance with the requirements of this Code.

(c) He shall make a census of the regular occupants of the building and estimate the maximum number of visitors by rooms and floors in order to determine whether the required means of egress are adequate.

(d) If the results of the survey and census show that the egress facilities are inadequate he shall advise the proper authorities of such discrepancy and indicate measures which would bring them up to the standards of this Code.

(e) He shall assign at least two exits for the occupants of each room in accordance with facts developed in the survey and the results of actual tests of exit time required. One of these should be the regular entrance.

(f) If possible, one or more exits should be reserved as entrances for firemen.

(g) He shall assign elevators to certain floors depending upon the building alarm signal given.

(h) When changes are made in the occupancy conditions he shall make such changes in the assignment of exits as may be necessary.

(i) He will notify all members of the exit drill organization regarding the general plan of exit assignment and the details pertinent to their specific duties, and examine them orally as to their familiarity therewith, going over the ground when necessary.

(j) He shall be responsible for planning the shutting off of electricity, power, gas, oil, etc., in case of alarm or fire.

NOTE. This position is differentiated from that of Chief of Fire Brigade, as the duties of the two officers have opposite purposes; one conducts persons away from the scene of a fire, while the other assembles men and apparatus to fight fire.

1113. FLOOR CHIEF. He shall have immediate charge of all occupants on his floor in all matters pertaining to exit drills. He shall be responsible for the enforcement of rules and will report infractions to the chief of exit drill.

(a) He shall personally supervise the sounding of the general building alarm on his floor, and see that each movement corresponding to alarm signal is promptly and properly executed.

(b) He shall be responsible for the condition of all aisles and passageways, and shall see that chairs, benches and stock in transit are promptly removed to insure unobstructed passageways.

(c) He shall select and designate the exits to be used by the occupants on his floor.

NOTE. It is required that he instruct the occupants in the use of all means of egress so that they will be familiar with all routes.

1114. ROOM CAPTAINS: Whenever floors are subdivided into two or more rooms there shall be room captains in each room who will see that each movement corresponding to the alarm signal is promptly executed. He will report to and obey the floor captain on his floor.

NOTE. Assistants should be designated for each of these positions capable of assuming the full duties thereof and in sufficient number to insure adequate supervision of exit drills in all parts of buildings. In large rooms it is advisable to have an Assistant Room Captain for every 50 occupants.

1115. EXIT GUARDS: Guards are subject to the orders of the floor chief or room captains. They shall see that the march from the rooms and in stairways is orderly, without crowding and at uniform speed, with careful observance of spacing between files; they shall be especially watchful to prevent stumbling, trampling or conditions which would require halting of exit march.

(a) Guards shall be stationed as follows: (1) One guard on the room side of exit door who shall see that it is opened promptly after the first signal and is kept open until all the occupants have left the room and then that it be closed; (2) at horizontal exit doors, in corridors and on stairway landings or turns. Guards will follow in the rear of the exit column and assist stragglers.

1116. SEARCHERS: There should be at least one man and one woman searcher on each floor. Upon sounding of building alarm they shall visit the toilet rooms and any rooms used and frequented by their sex in which there may be occupants who cannot hear the signal. They shall look out for any people who may become hysterical and faint. They shall leave the floor as soon as possible after the last squad leaves.

1117. MONITORS: Monitors shall have charge of squads of occupants, not to exceed 30 in any one squad; they shall see that the members of their squad quickly form in line, two abreast; they shall cause visitors in their territory to fall in with their squads. Monitors shall march at the head of their squads to the room exit assigned and then lead the march through corridors and stairways as directed by the exit guards.

(a) When directed to the sidewalk, monitors shall preserve squad formations and lead them a safe distance away from the building.

(b) When the proper signal is given, they shall return to their respective floors at the head of their squads.

(c) Monitors shall see that those in their charge conduct themselves in an orderly manner. They shall see that aisles and passageways are cleared of obstructions.

1118. INSPECTOR: He shall report to and obey the chief of exit drill. He shall examine each morning the condition of all doors, stairways, fire escapes and roof exits, if any, and report immediately to the chief of exit drill any obstructions or other unusual conditions. He shall test the building fire alarm system. (See par. 1003.)

**1119. SUBSTITUTES:** There shall be a substitute assigned to cover every position in the exit drill formation except the position of exit guards, for which there shall be one substitute for every two persons regularly assigned.

### **Selection of Personnel.**

**1120.** The chief of exit drill should be some one whose position commands respect and insures compliance with all orders and instructions relating to exit drills. Previous fire department or military experience is desirable.

(a) Floor chiefs should be men or women in responsible positions who have the trust and confidence of their associates, are self-possessed and capable of speaking the language of the occupants on their floors.

(b) Room captains should possess qualifications similar to those of floor chiefs.

(c) Exit Guards should be strong men, alert, cool headed and capable of acting quickly in emergencies.

(d) Searchers should be strong, cool headed men and women.

(e) Monitors should be selected from among the occupants for their fitness as leaders and disciplinarians.

(f) Inspectors should be active men, preferably those who have had fire department experience. In large establishments they should be uniformed.

### **Drill Exercises.**

**1121.** The course of action to be followed by any person discovering fire shall be to—

1. Warn others who are or may become endangered, utilizing the available alarm system or such other means as may be at their disposal.

2. Notify public fire department or regularly organized fire brigade using manual alarm box if available.

3. Proceed in accordance with assigned duties in evacuation of occupants or use of fire fighting equipment.

**NOTE:** For obvious reasons, drill exercises should follow the same routine, although sounding of public fire alarm may be simulated instead of actual. In large establishments where the discharging of crowds upon the sidewalks might cause uninformed persons to turn in an alarm, under the impression that there was actual fire, arrangements should be made to notify the local department regarding the time and place of exit drills.

**1122.** It is advisable that the alarms announcing drills should originate on different floors in order to afford practice in changing the order of procedure for possession of stairways; excepting that drill evolutions may be so arranged as to take advantage of the additional time required for the descent of those from the upper floors by dismissing such of the lower floors as would not delay the egress of the former.

**1123.** The marching speed should not exceed 130 steps per minute, without running.

### **Signals.**

**1124. FIRE ALARM** (see §1017): The alarm will sound simultaneously throughout each building and may be so designed that it will indicate the general locality of the fire.

(a) **DRILL GONGS OR BELLS:** These gongs or bells shall be hand operated on each floor by the floor chiefs or in each room by the room captains; signals consisting of single taps being employed to regulate exit drill movements.

(b) **ARM SIGNALS:** These will be used to regulate line movements.

1. **FORWARD**—Raise the right arm vertically above the head;
2. **MARCH**—Lower in the direction to be followed by the line.
3. **HALT**—Extend both arms horizontally across the line of march, holding this position until signal is obeyed.
4. **REVERSE**—Raise right arm vertically, moving the forearm in circular motion, and lower in the direction to be followed by the line.

(c) Upon the first stroke of the alarm for a given building, occupants will immediately cease work and as far as possible shut off power to machines and gas or other open flames, close doors and windows which are not to be used as exits. Thereafter each succeeding movement will be announced by single strokes on smaller bells or drill gongs sounded by the floor chief or room captain.

(d) **First Stroke of the Drill Gong:** Each occupant will remove any stock, chairs or benches nearest him in the aisles, placing same either under or on top of the work table, machine or desk.

(e) **Second Stroke:** Squads will form double lines facing the exit to be used, each couple joining hands and monitors will take positions at ends of lines nearest exit.

(f) **Third Stroke:** Signal for lines to move with their respective monitors to the door of exit passage. Each file will move forward, observing a one-pace interval on the level and allowing one clear stair tread between files on stairways. The subsequent line movements will be controlled by arm signals of either the room captain or floor chief. After leaving room, movement will be directed by arm signals of exit guards.

### **Elevators.**

1125. Elevators should be reserved for the use of the aged and decrepit who shall be conducted thereto by exit guards.

Upon the first sound of the building alarm elevator attendants shall discharge their passengers at the street level and take their cars to the floor indicated or previously assigned and hold themselves subject to the orders of the floor chief.

### **Power Plant.**

1126. Upon the first sound of the building alarm the power plant engineer shall shut off power to machines and shafting throughout the building, excepting in cases where it would affect the operation of the fire pumps, elevators or lighting system.

### **Posting of Notice.**

1127. The following is a recommended form of notice to be posted in establishments and read by or to each new occupant:

## EXIT DRILL INSTRUCTIONS.

Exit drills are intended for the safety of all occupants of this building and each employee should assist in successfully conducting the drills, realizing that their safety and that of the visiting public is greatly increased thereby. The stronger should assist and encourage the less vigorous or more timid.

### Organization.

The Chief of Exit Drills is in immediate command when fire alarm signals sound.

Floor Captains are in direct control of each floor and their instructions should be carefully obeyed.

Floor Captains will designate when and by what exit you are to leave the building. Wait until you receive his command to march.

Follow your monitors.

### In the Event of Fire.

Notify others in the building of the danger by the quickest method available.

Immediately send in alarm by operating nearest interior fire alarm box.

Telephone without delay fire headquarters and send in alarm from auxiliary box, or nearest city fire alarm box.

### When Alarm Apparatus Sounds in Workroom.

Operatives must:

Stop work.

Shut off power.

Stop machines.

Shut off gas and other open flames.

Close doors and windows opening upon or under fire escapes (excepting those to be used as exits).

Put chairs, stools and other obstructions on top of or under benches to clear the passageway.

Form line promptly with front of column facing the usual egress aisle and wait word of command or signal from Floor Captain.

### At Command of March.

March in rapid, orderly manner from building, two abreast as instructed, not crowding upon the couple immediately in front of you, following your monitor.

Preserve the interval in line between yourself and couple in front of you.

Retain formation until dismissed or the line is returned to building.

Women and children always have the right of way.

**DON'T**

Don't run.

Don't lag behind, breaking up columns.

Don't scream or make unnecessary noise.

Don't laugh or talk.

Don't cause confusion.

Don't remain in toilet or dressing room.

Don't return for your clothing.

Don't try to use elevators.

Don't attempt to leave place in line until you return to the building.

Don't attempt to leave building except in accordance with exit drill regulations.

Don't fail to assist in carrying out instructions.

All exit doors must be kept unbolted and unlocked during working hours.

**SUGGESTED****FIRE EXIT DRILLS FOR HOSPITALS, SANITARIUMS,  
and CORRECTIVE INSTITUTIONS.**

(See also Section 24)

1150. As outlined in §2401 and §2402, safety to life in buildings housing sick, infirm and restrained patients is predicated upon fire-safe construction, fire prevention and protection, adequate and competent personnel, and proper exits.

NOTE: Such occupancies comprise, in large part, varied degrees of physical disability, and removal to the outside, or even disturbance by moving is inexpedient or impractical in many cases, except as a last resort. Similarly, recognizing the operating necessity for restraint of the insane and incorrigible (oftentimes by use of barred windows and locked doors) exit drills are usually extremely disturbing, detrimental, and frequently impracticable.

In most cases fire and exit drills as ordinarily practised in other occupancies cannot be conducted in hospitals and institutions. Fundamentally, superior construction, early discovery and extinguishment of incipient fires, prompt notification, must be relied upon to reduce the occasion for evacuation of buildings of this class to a minimum.

Penal and corrective institutions housing those able to walk do not come within the scope of the Hospital fire drill. For them, discipline is such that habitual control of the occupancy admits of excellent exit drills along the lines recommended in other sections for industrial establishments or schools. Reformatories and asylums should employ a combination of the two drills, depending upon the age of the occupants and the proportions of manual and educational training. All infirmary sections, sick bays, maternity wards, etc., of such institutions should, however, conform to the drill code for hospitals.

1151. Overcrowding in such buildings has a direct bearing on the probability of fire as a hazard to life. Similarly, insufficiency of employees and of attendant supervision decreases the possibility of discovery of fire and transmission of alarm, contributes to panic, and precludes the orderly conduct of fire drills.

1152. The practice of leaving an entire building in the hands of a single member of the staff and a few attendants or nurses is deplored. Leave of absence and "off duty" are not recognized as arguments for the diminution of attendant corps, as commonly practised. Peculiarly enough, overcrowding and lack of attendants are often contemporary. In a crisis, this combination may disorganize the best laid plans for fire and exit drills.

**Signals.** (See also Sections 10 and 24.)

1153. Fire drills in hospitals and sanitariums should include the transmission of a fire alarm signal and simulation of emergency fire conditions except that the movement of infirm or bed-ridden patients to safe areas or to the exterior of the building is not required. Drills should be conducted at irregular intervals, during daytime and nighttime periods of operation, to familiarize hospital personnel (nurses, internes, maintenance engineers, and administrative staff) with coded transmission of signals, location and use of first aid fire appliances, and emergency action required under varied conditions and locations in the building.

NOTE: Many hospitals conduct successful fire drills without disturbing patients by advance planning in the choice of location of the simulated emergency and closing doors to patients' rooms or wards in the vicinity prior to the initiation of the fire drill.

1154. Hospitals should be patrolled at regular intervals, the person charged with this responsibility visiting all parts of the premises including closets, attics, etc. for the purpose of discovering fire in its incipency.

### **Fire Marshal in Charge of Drills.**

1155. The marshal or institution fire chief in charge of fire drill procedure should be a fireman of experience, possessed of those qualifications demanding respect and attention, and capable of performing his diverse duties with alacrity and intelligence.

NOTE: Depending somewhat upon the character of buildings, their size and the type of patients housed, the importance of this position should not be underestimated. An ardent and conscientious fire fighter, receiving the cooperation of the staff in his work, adds materially to the safety of the occupants.

### **1156. DUTIES OF THE FIRE MARSHAL.**

(a) He shall be responsible for the location and sufficiency of first aid fire-fighting appliances, and, by regular inspection, shall supervise their repair and maintenance. He shall instruct all employees, including the staff, in the actual handling of extinguishers and in the actual extinguishment of prepared bonfires to acquaint the personnel with their proper use, and to discourage any misgivings concerning handling such appliances.

(b) He shall, by instruction and direction, educate all employees in the purpose and use of the fire alarm system and in the fire drill (and exit drill, if any) in response to alarms.

(c) The method of handling hose lines from interior standpipes should be demonstrated to and practised by all male employees in the separate buildings, and, where chemical tanks or carts are employed, their proper use and handling should be explained and drilled. In cases where water casks and buckets may serve to advantage, bucket brigade drills should be practised.

NOTE: The extent of free brigade practice and drill, and the locations for its performance should not interfere with essential hospital routine. The superintendent should carefully study and consider this problem in cooperation with the fire marshal. Unless otherwise specifically designated, the methods of fire-fighting shall conform to the recommendations of the National Fire Protection Association for Private Fire Brigades.

(d) The fire marshal shall make regular inspections of attics, basements, wards, closets and storage spaces, with power to order the removal of unnecessary accumulations of combustibles and to remove all egress obstructions and fire hazards, both structural and operative.

(e) The fire marshal shall note all repairs necessary to fire doors, exit doors, ramps, stairs and other means of egress. Cooperating with the engineer, he shall check up and maintain adequate water supply to sprinkler systems, standpipes, etc., recording for repair all leaks and deficiencies coming to his attention.

### **Exit Drills.**

NOTE: Attention is called to the requirements of §2431 to §2449 of the Section on Hospitals, which recommends and in some cases requires facilities for egress in a lateral direction. (See also §1150.)

1157. Due to the generally low ratio of attendants to patients and to the inability to hold regularly practised drills as in other occupancies, no regular or constant designation of those responding to fire alarm can be made. All employees should be schooled in the duties of members of the fire brigade in extinguishment of fire, as monitors to direct walking patients, and as guards for attention to bed patients. The relatively large turnover of employees in this class of occupancy accentuates the importance of constant and regular attention to preparedness in fire prevention and protection.

1158. Convalescent patients should be removed from involved zones lest their curiosity or anxiety hamper fire brigade activity, or cause themselves injury. All sections should be assured of a necessary complement of doctors, nurses, attendants and other employees in reserve in readiness to assist in the transfer of bed patients to less exposed areas or sections.

### **Procedure in Case of Fire.**

1159. The following practice is recommended wherever practicable. Modification of the plan or portions thereof may be necessitated by local conditions. The plan is intended to be applicable to any and all employees. It should be noted that the best laid plans for fire drills in existing buildings of substandard or unsuitable construction cannot be expected to ameliorate deficiencies of construction contributing to fire probability, or the opportunity for fire spread.

**1160. DISCOVERY OF FIRE.**

(a) The person discovering a fire shall immediately send an alarm from the nearest fire alarm box with the least disturbance and commotion and shall see that all doors adjacent to the fire are closed.

(b) He shall advise another employee of location of fire, who in turn shall confirm the original alarm to the main office, and who shall join the discoverer near the fire.

(c) The discoverer shall immediately return to the scene of fire, if possible, and attempt to extinguish it with first aid appliances available.

**Fire Brigade.**

1161. Those first responding to the fire, together with the alarmists, constitute the first fire defense. They shall strive to extinguish the blaze with the least confusion and annoyance to adjacent sections. Instructions should be "KEEP YOUR HEAD AND DO NOT QUIT, even though unsuccessful, but endeavor to check spread until arrival of the fire department."

**Monitors.**

1162. The next arrivals, other than actually engaged in fire fighting, and simultaneously with that work, constitute monitors pro tem. They shall open horizontal exit doors to adjacent sections away from the fire, and conduct ambulant patients immediately thereto. Certain of these monitors shall remain with their charges, in readiness to conduct them still farther distant from the source of danger. Any surplus monitors shall return to check up delinquents and serve as guards in the involved section.

NOTE. Monitors shall be provided with the necessary keys to operate all locks on detention room and wards, ward exits and other egress doors.

**Guards.**

1163. Other arrivals at the fire are guards whose duty it shall be to reassure and endeavor to quiet bed patients in the immediate zone of fire or smoke, and proceed to move the beds of the more seriously excitable to points of vantage in the event of the need for evacuation. By this time, assistance of monitors should be available, and an adequate force must stand guard for this emergency.

1164. If the fire is uncontrollable, or has developed a bad smoke hazard, all available guards, monitors and firemen shall move patients out of the sections involved by rolling or sliding their beds or mattresses through horizontal exits or down ramps where available; or, as a last resort, if required by continued fire and smoke spread in the sections vacated, by carrying patients in mattresses down stair towers and to the outside.

## FIRE EXIT DRILLS IN SCHOOLS

(See also Section 21)

1170. The following requirements are of necessity, general in scope, as it is appreciated they must apply to all types of schools as well as conditions of occupancies, such as truant schools, schools for mentally defective, the blind, deaf and dumb, colleges and public schools. It is fully recognized that no one code can meet all the conditions of the various buildings involved and it will be necessary for some school authorities to issue supplements to these requirements, but all supplements should be consistent with these requirements.

1171. There shall be at least eight fire exit drills a year. In those climates where the weather is severe during the winter months, it is suggested that weekly drills be held at the beginning of the school term so as not to endanger the health of the pupils.

**NOTE:** It might be well to hold "practice" drills during inclement or winter weather. Such drills would be held at the regular dismissal time, when the pupils are fully clothed, by using the exit drill alarm signal. With such drills there would be no necessity of a return signal.

1172. Drills should be executed at different hours of the day or evening; during the changing of classes; when the school is at assembly; during the recess or gymnastic periods, etc. In other words, they should be executed at such irregular times as would tend to destroy any possible distinction between drills and actual fires. Cards of instruction should be conspicuously posted describing the procedure of the drills.

1173. If a drill is called when pupils are going up and down the stairways, as during the time classes are changing without any semblance of order, the pupils should be instructed to form in file and immediately proceed to the nearest available exit in an orderly manner.

1174. Exit drill alarm systems should be installed in accordance with the requirements of Section 10 of this code. All exit drill alarms should be sounded on independent signal systems and not on the signal system used to dismiss classes. Instructions in the manner of sounding exit drill signals and sending fire alarms should be given to all pupils so that there will be no delay either in emptying the building or calling the fire department in case of an actual fire. Whenever any of the school authorities determine that an actual fire exists, they shall immediately call the local fire department using the public fire alarm system. (See §1018.) In order that pupils will not be returned to a building which is burning, the recall signal shall be one that is separate and distinct from and cannot be mistaken for any other signals. Such signals may be given by distinctive colored flags or banners. If the recall signal is electrical, the buttons should be kept under lock, the key for which should be in the possession of the principal or some other designated person in order to prevent a recall at a time when there is a fire. Regardless of the method of recall, the means of giving the signal shall be kept under a lock.

1175. As all drills represent an actual fire condition (see §1103) pupils should not be allowed to obtain clothing, after the alarm is sounded, even when in home rooms, on account of the confusion which would result in forming the lines and the danger of tripping over dragging apparel. In order to avoid congestion around the school building which might interfere with the local fire department, each class or group should move to a predetermined point.

1176. Wherever possible, drill lines should not cross a street or highway, especially where the traffic is heavy. Where necessary for drill lines to cross roadways, hand signals reading 'STOP! SCHOOL FIRE DRILL' shall be carried by monitors to the traffic intersecting points in order to stop traffic during the period of the drill.

NOTE. It is recommended that where drill lines must cross roadways, a police officer, school janitor, or a male teacher acting as a traffic officer be on duty to control traffic during drills.

1177. Every fire exit drill shall be an exercise in school management for principal and teachers. The chief purpose of every drill is complete control of the class so that the teacher will form its ranks quickly and silently, may halt it, turn it or direct it as desired. Great stress shall be laid upon the execution of each drill in a brisk, quiet and orderly manner. Running should be prohibited. In case there are pupils incapable of holding their places in a line moving at a reasonable speed, provisions should be made to have them taken care of by the more sturdy pupils, moving independently of the regular line of march.

1178. Monitors shall be appointed from the more mature pupils to assist in the proper execution of all drills. They shall be instructed to hold open doors in the line of march and assist in every practical manner to create an orderly and perfect drill. There shall be at least two substitutes for each appointment so as to provide for proper performance in case of absence of the regular monitors. The searching of toilet or other rooms shall be the duty of the teachers or other members of the staff. If the teachers are to do the searching, it should be done after they have joined their classes to the preceding lines. If, for any reason, a line becomes blocked, some of the pupils should be countermarched to another exit in order to prevent panic conditions arising as a result of inactivity.

1179. It shall be the duty of principals and teachers to inspect all exit facilities daily in order to make sure that all stairways, doors and other exits are in proper condition. Particular attention should be given to keeping all doors unlocked, having doors closed which serve to protect the safety of paths of egress (such as doors on stairway enclosures) and under no conditions blocked open, keeping outside stairs and fire escape stairs free from all obstructions and clear of snow and ice, allowing no accumulation of snow or ice or materials of any kind outside exit doors which might prevent the opening of the door or interfere with rapid escape from the building.

Any condition likely to interfere with safe exit should be immediately corrected if possible, otherwise reported at once to the appropriate authorities.